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Issue Briefing Paper

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Title WHY FIGHT THE GYPSY MOTH?

BACKGROUND

Leaf-eating gypsy moth caterpillars chew up trees over more and more of the nation every year. In 1980 they stripped a record 5.1 million acres of forests, mainly in the northeastern states, at a cost of millions of dollars. They've spread far enough to make some people say we've lost the fight and ought to give up our efforts against them.

Other people think we ought to be doing more. They'd like to see massive treatment programs which, they say, could get rid of every gypsy moth in the country.

Homeowners watching the pest denude their carefully tended plantings, a campground owner losing several weeks' business in the peak season because campers don't want to pitch tents under bare trees, a hiker walking through a once-attractive landscape bared by the moth--all may demand action. Others who haven't experienced the devastation the moth can cause may wonder what all the fuss is about. Let it spread throughout the country, they say.

Gypsy moth outbreaks are cyclic. The caterpillars may do little damage for several years. But when their populations build up, as they have recently, the pests can strip a whole forest in a few days, render picnic and camping spots unusable, destroy home plantings and cause a nuisance in residential areas. Hardwoods may die after the caterpillars have stripped their leaves for several consecutive years. Evergreens may die after one stripping.

The gypsy moth is a native of the temperate regions of Europe, southern Asia and Africa. It became established in the United States when a few, brought to this country to study their value in connection with silk production, escaped in Medford, Mass., in 1869.

LIFE CYCLE

Only the caterpillar stage of the insect causes damage. The moth has one generation per year. The caterpillars hatch in late April or early May from eggs laid in velvety, buff-colored masses on trees, under rocks, on vehicles, or in almost any other protected place out-of-doors.

The caterpillars are easy to identify by the two rows of red and blue dots that develop on their backs when they are half-grown. When mature they are 1-1/2 to 2-1/2 inches long.

The caterpillars continue feeding until late June or early July, when they enter the pupal stage. Inside a hard, dark-brown case, they turn into adult moths.

The adult male is dark brown with wings that measure about 1-1/2 inches from tip to tip. It is a strong flyer. The female is white, heavy-bodied and somewhat larger than the male. She doesn't fly. After mating, the female lays her eggs. By this time it is midsummer, and the eggs remain dormant until the following spring.

HOW THE MOTH HAS SPREAD

Following its escape in Massachusetts, the pest quickly spread. By the 1880's, it was stripping forests in eastern Massachusetts, and the state began a program to get rid of the pest.

It may be that if today's methods and materials, such as aerial spraying and more effective insecticides, had been available then, the pest could have been quickly eradicated.

But 19th-century technology was no match for the moth. By 1900, officials dropped their eradication plans and turned to containment. Plant protection workers have been looking ever since for ways to live with the pest, control its damage, and slow its spread.

U.S. Department of Agriculture involvement began in 1906, when the USDA entered into a control program with Massachusetts. Today, most gypsy moth operations are joint undertakings with the states and often other federal agencies and private industry, as well.

Years went by and the moth gradually took up residence in most of New England's forestland. It also moved south and west, reaching the eastern bank of the Hudson River in the early 1950's. There, DDT treatments helped slow its spread until this use of the chemical was outlawed.

Forced to use less effective tools, state and federal pest control experts watched the leaf-eater invade the rest of New York plus New Jersey and much of Pennsylvania. The long, parallel ridges east of the Alleghenies provided the perfect avenue for rapid spread.

In 1979, the first noticeable damage was recorded in Maryland and Delaware, as well as in a remote infestation in central Michigan. If left unchecked, the moth could damage trees wherever oaks and other susceptible hardwoods are major forest components.

Experts aren't sure how large the susceptible area is but agree it includes most of the United States.

Wind is the chief means of the pest's natural spread. When disturbed, newly hatched gypsy moth larvae drop from tree branches on silken threads and are readily carried by light drafts of wind. Infestations advance only by a few miles per year on level ground but under certain geographic conditions--such as between mountain ridges--they can move faster.

Artificial spread of the insect--primarily through its egg mass--concerns authorities the most. The pest is spread artificially throughout the country primarily by traveling on outdoor household goods, shrubs, trees and other ornamental plants, firewood, recreational vehicles and mobile homes.

WHAT'S BEING DONE

Today's gypsy moth programs span a number of agencies. To provide coordination, USDA formed an interagency steering committee. It consists of representatives of the USDA's Animal and Plant Health Inspection Service, Forest Service, Science and Education Administration and affected states. Subcommittees on research, operations and information provide backup for planning control, regulatory, detection and other aspects of the effort.

To help keep the pest from causing major damage in the generally infested area, Forest Service takes the lead in developing control programs in the Northeast. All are conducted on a local-option basis with cost-sharing among local governments, via cooperative grants-in-aid to the state foresters or state agricultural offices.

The Animal and Plant Health Inspection Service enforces regulations to prevent people-caused spread of the moth. The agency monitors infested campgrounds, nurseries and outdoor household goods from infested areas to decrease the risk of the moths' hitchhiking to new areas with people or products. Inspectors also examine and treat mobile homes and other items likely to harbor the pest before leaving heavily infested areas.

To help detect new infestations while they are still small enough to be eliminated, thousands of cardboard traps baited with a synthetic sex attractant, or pheromone, are placed throughout the country every year. The Animal and Plant Health Inspection Service, aided by the states and the Forest Service, coordinates trapping. Volunteers from the National Campers' and Hikers' Association and other groups also participate.

When outlying infestations are discovered, the Animal and Plant Health Inspection Service initiates eradication efforts in cooperation with the affected state. State, federal and local officials carefully consider alternatives and present their plans to residents at public meetings. Tools used are tailored to the nature and size of the area, its environmental sensitivity, the intensity of the outbreak, and the likelihood of spread to other areas. Desires of local residents and landowners are also taken into account.

Isolated outbreaks have recently been eliminated as far away from the general infestation as San Jose, Calif., and Renton, Wash. These probably resulted from the pests' hitchhiking from the Northeast with people--on vehicles or in commerce. Several Midwestern outbreaks have been traced directly to movement from the Northeast.

Methods used to knock out isolated infestations vary from conventional insecticides, used in Ohio, Michigan and elsewhere; to an insect growth regulator used in North Carolina and Virginia; to a virus used in combination with the pheromone in Wisconsin; to release of sterile insects being piloted in Michigan. With this technique, male moths are sexually sterilized with precise doses of radiation and released to mate with female moths in the forest. Eggs laid will not hatch.

Continuing research and development play vital roles in the gypsy moth effort. Safe, more effective chemical and biological materials; better ways to rear gypsy moths in the laboratory; new application methods; improved trap design; and collection, screening, and distribution of additional imported parasites that help control the moth in its homeland overseas are some of the areas being investigated.

A major breakthrough was made in 1970 when Science and Education Administration researchers synthesized the pheromone disparlure. They developed it by analyzing hundreds of thousands of tips of the abdomens of female moths, collected in the United States and Spain. Disparlure is a more potent sex attractant than that of the natural female. It is now the standard for pheromone survey trapping and is also being used in various formulations for suppressing low-level populations.

These investigations are leading to new and improved techniques to help suppress moth populations to below damage and nuisance levels. One plan suggests treating areas with pesticides only when moth populations threaten damage and allowing natural controls to operate between times in the generally infested area.

Trying to eradicate the moth from the entire United States would involve unacceptable dollar, human power and environmental costs and might well be impossible in any case. But the present program is buying time for the uninfested area while better pest management systems are developed to deal with the gypsy moth.

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This Issue Briefing Paper updates IBP No. 24, issued March 21, 1980, which is now out of print.